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THE EFFECTS OF MAGNETIC STORM PHASES ON F-LAYER IRREGULARITIES  
FROM AURORAL TO EQUATORIAL LATITUDES

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July-30 September, 1990

In the last quarterly report a full outline of the developing pattern of irregularity penetration in the high latitude region and occurrence in the equatorial latitudes was given. The studies were done over a long period of time and a summary of early results was given at the Ionospheric Effects Symposium. During this quarter three papers were completed and are listed below. In addition a summary of the two papers submitted to Radio Science will be given at the AGARD Electromagnetic Wave Propagation Panel Meeting in Greece in October 1990. The AGARD paper will be published in the AGARDOGRAPH for that meeting. In one section of the AGARD paper, routine observations of auroras and SAR arcs taken by Boston University at Millstone Hill were compared to irregularity penetration.

The following papers have been submitted to Refereed Journals:

- Aarons, J. and A.S. Rodger The effects of electric field and ring current energy increases on F-layer irregularities: Part 1. auroral and sub-auroral latitudes. Submitted to Radio Science
- Aarons, J. The role of the ring current in generating f-layer irregularities during magnetic storms: Part 2: equatorial latitudes. Submitted to Radio Science
- Aarons, J. J.C. Foster, and A.S. Rodger Auroral and sub-auroral F-layer irregularities and high plasma convection during the magnetically active periods of September 17-24, 1984 Submitted to Ann. Geophysicae

The following paper was published.

Goodman, J. and J. Aarons (1990) Ionospheric effects on modern electronic systems; Proceedings of IEEE 78, 512-527

A presentation was made at COSPAR 1990 by N. Balan on data he had assembled when working at Boston University.

The effects of magnetic storm phases on F-layer irregularities  
N. Balan, J. Aarons, A.S. Rodger and C.A. Gurgiolo

A second paper was presented at COSPAR that dealt with the comparison of imaging data taken at Kwajalein (August 1988) with simultaneous San Marco satellite in situ observation of equatorial plasma irregularities; this is work on correlating optical, radar, and radio observations at high and equatorial latitudes.

Simultaneous All-Sky Optical Airglow Imaging Observations and San Marco Satellite Measurements in the Pacific Sector  
M. Mendillo, J. Aarons and P. Sultan

FUTURE WORK: Future work will address the problem of irregularity development during low sunspot number years and will work towards determining the correlation of irregularities with SAR arc data taken at Millstone Hill and optical, radar, and radio correlations at equatorial latitudes.



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